

## **SOIL SAMPLING GUIDANCE**

The Enforcement Division (ENFD) of the Montana Department of Environmental Quality (DEQ) has developed this guidance to assist environmental consultants and cleanup contractors to determine the minimum number of confirmation soil samples to be collected when conducting assessment and remedial actions at release and spill sites conducted under ENFD's oversight. ENFD classifies release or spill sites as either Small Sites (an excavation floor of 5,000 square feet or less) or Large Sites (an excavation floor of more than 5,000 square feet).

Please note the following are the minimum recommendations and may not be applicable to all release or spill sites managed by ENFD. ENFD staff may modify the number of samples collected based on site-specific conditions.

Confirmation soil samples are to be collected at the completion of remedial actions at a release or spill site. The confirmation soil samples are collected from the base of the excavation, and along the excavation sidewalls when the depth of the excavation exceeds two feet. Confirmation soil samples should be biased and collected from the worst case areas or where the highest concentrations would be expected based on product pooling, visible contamination, field screening, soil type, or other site-specific characteristics. Soil samples are collected, analyzed, and evaluated to verify the effectiveness of the remedial activities and demonstrate that any remaining contaminants are below DEQ's Tier 1 Risk-Based Corrective Action (RBCA), Risk-Based Screening Levels (RBSLs) or other published cleanup levels when there are no RBCA, RBSLs for the contaminant(s) of concern.

All confirmation soil samples collected during assessment and remedial actions are to be analyzed per RBCA protocols (see [Table A](#)) by an approved laboratory. If the material spilled or released is not listed in Table A of this document, the most appropriate Environmental Protection Agency (EPA) analytical method should be selected. It is recommended that the analytical laboratory be contacted in order to determine the appropriate analytical method. All confirmation soil samples are to be collected and preserved in accordance with EPA and standard industry protocols.

### **A. Confirmation Soil Sampling**

ENFD allows for compositing confirmation soil samples collected and submitted for extractable petroleum hydrocarbon (EPH) analysis. Discrete sampling methods are required for all soil samples collected and submitted for volatile petroleum hydrocarbon (VPH) analysis. Compositing of soil samples for VPH analysis is not acceptable.

The minimum number of samples from the excavation floor and sidewalls should be collected and analyzed as discussed below. Sidewall samples are not required for excavations less than or equal to two feet in depth. For irregularly shaped excavations where four sidewalls are not readily discernible, divide the total wall perimeter into four segments of approximately equal size for collection of excavation sidewall samples.

#### **1. Small Sites**

##### **a. Excavation with depths less than two feet:**

- One 5-point composite soil sample collected for each 625 sq ft of excavation floor to be submitted for EPH analysis.
- Two discrete (grab) soil samples collected for each 625 sq ft of excavation floor to be submitted for VPH analysis.

b. Excavation with depths greater than two feet:

- One 5-point composite soil sample collected for each 625 sq ft of excavation floor to be submitted for EPH analysis.
- Two discrete (grab) soil samples collected for each 625 sq ft of excavation floor to be submitted for VPH analysis.
- One 5-point composite soil sample collected for each 25 linear feet of excavation sidewall to be submitted for EPH analysis.
- Two discrete (grab) soil samples collected for each 25 linear feet of excavation sidewall to be submitted for VPH analysis.

c. Excavation with depths greater than six feet:

Where the depth of the excavation is greater than six feet, the sidewall should be divided into upper and lower sections and soil samples should be collected from each sidewall as follows:

- One 5-point composite soil sample collected from each upper and lower sidewall for every 25 linear feet of excavation sidewall to be submitted for EPH analysis.
- Two discrete (grab) soil samples collected from each upper and lower sidewall for every 25 linear feet of excavation sidewall to be submitted for VPH analysis.
- One 5-point composite soil sample collected for each 625 sq. ft of excavation floor to be submitted for EPH analysis.
- Two discrete (grab) soil samples collected for each 625 sq ft of excavation floor to be submitted for VPH analysis.

## 2. Large Sites

The minimum number of confirmation soil samples required to be collected will be determined on a site-by-site basis in consultation with the ENFD project manager.

**TABLE A**  
**(From 2009 RBCA Guidance Document)**

Petroleum Product	VPH	EPH Screen	EPH Fractionation	EPH for PAHs	RCRA Metals	EPA Method 8260B	Oxygenates & Lead Scavengers
Gasoline/Aviation Gasoline	R						SS
Diesel (#1 & #2)	R	R	X				
#1 - #2 Heating Oils	R	R	X				
#3 - #6 Fuel Oils		R	X	SS			
Used/Waste Oil	R	R	X	SS	R	R	SS
Kerosene, Jet Fuel (Jet-A, JP-4, JP-5, JP-8, etc.)	R	R	X				
Mineral/Dielectric Oils		R	X				
Heavier Wastes		R	X	SS			
Crude Oil	R	R	X	SS			
Unknown Oils/Sources	R	R	X	SS	R	R	SS

R - Required analysis

X - Analysis to be run if the EPH screen concentration is >200 ppm THE

SS - Site Specific